

CLARK FORK HATCHERY  
ANNUAL REPORT

October 1, 1989 to December 31, 1990

Prepared by:

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## INTRODUCTION

The Clark Fork Hatchery is a license-funded resident species "specialty" station located 1.5 miles northwest of Clark Fork, Idaho. Fish reared and stocked during the year totaled 697,613 (24,113 lbs) and consisted of 14 species and strains stocked in Region 1 (Table 1). Over 37,000 westslope cutthroat trout are maintained on station as broodstock. Fish traps are operated to take kokanee eggs from naturalized populations in Region 1. Additional eggs and fish are received from federal, state, and private sources. Rearing units include Heath incubator stacks, concrete and fiberglass **early** rearing vats, concrete raceways, and earthen broodstock raceways. Water is diverted from Spring Creek for incubation and rearing, providing 8-15 cfs, at temperatures averaging 41°F in winter and 48°F in summer. A well provides approximately 100 gpm of 45°F water to the incubators. Any excess goes to fiberglass troughs to mix with Spring Creek water.

## HATCHERY IMPROVEMENTS

No major improvements were made at the hatchery during 1990.

## PUBLIC RELATIONS

There were over 3,000 visitors at the hatchery this year, including public school tour groups from Clark Fork, Hope, and Sandpoint.

Considerable time was spent working with the Lake Pend Oreille Idaho Club, Metropolitan Mortgage and Securities Inc., Trout Unlimited, and Washington Water Power to expand the net pen rearing project for westslope cutthroat on Lake Pend Oreille. The purchase, construction, and operation of the project primarily utilized non-Departmental resources. Rearing started in October 1989. Public support and media coverage have been high.

Mountain lake stocking was also a cooperative effort. The U.S. Forest Service and Region 1 personnel provided assistance with about half the lakes.

## FISH PRODUCTION

Fish production at the Clark Fork Hatchery changed substantially since the last production year. During 1989-1990, a total of 697,613 fish, for 24,113 pounds (Table 1), were stocked from local production versus 2,276,653 fish at 25,378 pounds in 1988-1989. This visibly reflects the redirection of effort towards larger cutthroat trout and away from high numbers of very small cutthroat and kokanee.

Table 1. Fish requested and produced, October 1, 1989 to December 31, 1990.

Species/size	Production goal	Number produced	Pounds produced	Percent of goal
brook Bk/1	20,000	27,459	80.75	138%
cutthroat C2/1	42,000	42,090	18.32	100%
cutthroat C2/2	342,500	353,743	23,163.90	103%
Kamloops K1/1	20,500	12,928	64.00	63%
Kamloops K2/2	60,000	72,223	527.00	120%
kokanee KL/1	133,000	178,862	341.27	134%
rainbow R_/3	111,000	115,014		104%

Eggs received come from a variety of sources, including State and private sources, as well as trapping of naturalized fish (Table 2). The majority of fish are released within six months of receipt, with only the Kamloops (K1 and K2) and westslope cutthroat trout retained past the fry stage. All kokanee (KL) eggs came from the Lake Coeur d'Alene traps. The 221,000 eggs kept for rearing (Table 2) reflects an 86% reduction in kokanee reared at Clark Fork Hatchery.

Fry were stocked in over 15 lowland lakes and streams by truck and packed or flown to another 21 mountain lakes. Fry totaling 566,768 (listed in Table 3) are Clark Fork stock westslope cutthroat trout that were held over for further rearing.

Kamloops totaling 91,610 (K1 and K2) were released in Hayden Lake; 72,223 K2 were released in March and 19,378 K1 in August and September.

The production of 353,443 two-year-old cutthroat (Table 4) exceeded regional stocking requirements by 3% (Table 1). Priest Lake received 95,284 adipose-clipped Clark Fork stock westslope cutthroat trout, released at nine different sites in the southern half of the lake. The fish averaged 6.0 inches in length. The remainder were stocked in other Region 1 lakes. An additional 8,866 fish were held for broodstock replacement.

#### **REDISTRIBUTION**

In addition to production of fry and fingerlings, the Clark Fork Hatchery has the responsibility for redistribution of fish north of Coeur d'Alene in Region 1. Catchable-sized (Size 3) rainbow trout are received by tanker from state hatcheries in southern Idaho, held, and then stocked from April through October. The number of trout stocked (Table 5) should be spread evenly over the season and could easily result in numerous trips with less than maximum loads. By combining several stocking sites for each trip and weighing out fish rather than dumping whole compartments, costs were kept at a minimum.

Other species redistributed by the Clark Fork Hatchery are included in Table 5.

#### **SPAWNTAKING**

Cutthroat spawning (Table 6) commenced in late April and was completed during May. In an attempt to improve eye-up in westslope cutthroat, which has been typically very poor, two modifications to egg handling has continued. First, use of a .75% saline solution diluent was added to eggs and milt during the fertilization process. Secondly, the iodophor disinfection solution of 100 ppm Argentyne was buffered with sodium bicarbonate at 3.7 grams per gallon. Typically, eggs water-hardened in Spring Creek water are disinfected for 10 minutes in this iodophor solution before being placed in the Heath incubator stacks. Hatchery personnel indicated that, in past years, a large increase in

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Table 2. Eggs received and survival to feeding fry, October 1, 1989 to December 31,1990.

<u>Species/strain</u>	<u>Date received</u>	<u>Source</u>	<u>Number</u>	<u>Percent hatch</u>	<u>Release Destination</u>	<u>date</u>
brook Bk	12/89	Henrys Lake	59,090	87%	Region 1	6-7/90
cutthroat C2 Clark Fork	5/80	broodstock	1,385,582	54%	Region 1	90-91
Kamloops K1	3/90	Skane's	31,750	97%	Hayden Lk.	4-5/90
kokanee KL	11-12/89	CdA Lake	221,003	88%	Region 1	6-7/90

Table 3. Fry production and survival to release, October 1, 1989 to December 31, 1990.

Species	Source	Eyed eggs	Fry stocked/ transferred	Percent survival to stocking/ transfer	Cost (to nearest 1,000)
brooks BK	Henrys Lake	59,090	27,459	46%	\$ 3,000
cutthroat C2	broodstock	752,625*	42,090	44%	\$57,000
Kamloops K1	Skane's	31,750	19,378	86%	\$ 3,000
Kamloops K2	Spring Creek	92,204	72,223	78%	\$ 3,000
kokanee KL	CdA Lake	207,345	178,862	86%	\$16,000

\*700,596 eggs were held over for size 2 plants and brood stock.

Table 4. Subcatchable cutthroat production, October 1, 1989 to December 31, 1990.

Number on hand 10/189	Pounds on hand 10/1/89	Number stocked or transferred	Pounds stocked or transferred	Percent survival	Cost
388,255	10,460	353,443	22,976	91%	\$36,000

Table 5. Fish redistribution, October 1, 1989 to December 31, 1990

Species/size	Source	Number	Cost	Cost per fish
Rainbow K1,R4,R8/3	American Falls SFH Nampa SFH	115,014	\$16,700	\$.145
browns	Nampa SFH	1,500	\$400	\$.266
channel CC/3	Arkansas	35,250	\$500	\$.014
cutthroat C2/3	Sandpoint SFH	6,010	\$1,000	\$.166
golden GN/1	Ashton SFH	1,410	\$400	\$.284
grayling GR/1	Ashton SFH	4,500	\$400	\$.098
hybrids RC/2	Mullan SFH	6,366	\$450	\$.071
splake SP/3	Grace SFH	5,709	\$300	\$.053
tiger muskies TM/3	Hagerman SFH	2,547	\$400	\$.155

Table 6. Spawning summary, October 1, 1989 to December 31, 1990.

Species	Eggs taken	Number of females	Eggs per female	Eyed eggs	Percent eye-up	Cost
cutthroat C2	1,383,582	4,555	303	752,625	54%	\$3,123
Kokanee KL	751,476*	740+	298	207,345	93%	\$4.461

\*530,956 of these eggs were taken to Cabinet Hatchery.

+Number of females needed to produce 207,345 eyed eggs.



dead eggs was observed following this disinfection. Although space constraint prevented scientific method in evaluating these techniques, eye-up percentage was at 52%. This is about the same as historical records for westslope cutthroat trout. However, reduction of dead eggs following disinfection was observed.

Kokanee spawning began in mid-November 1989 and was completed by the end of December. A total of 2,591 females were spawned from two Lake Merwin traps located in Lake Coeur d'Alene. Eggs totaling 751,476 were taken, for an average of 290 eggs per female. Of these, 221,000 (Table 6) were kept at Clark Fork Hatchery and the remainder taken to Cabinet Gorge Hatchery. This spawning operation was turned over to the Sandpoint Hatchery in the fall of 1990.

## **FISH HEALTH**

Broodstock disease inspections were made on Coeur d'Alene kokanee (KL) and Clark Fork Hatchery fish (Table 7). The on-station broodfish, as well as the 1988 and 1989 brood years, were positive for BKD and/or coldwater disease (Table 7).

Resident brook trout from the headrace above the long raceways and the water supply above the hatchery were captured and examined by Idaho Department of Fish and Game (IDFG) pathologists. These fish were negative for bacterial pathogens but positive for Infectious Pancreatic Necrosis (IPN) viral pathogens (Table 7).

Broodstock, aged four and five years, were lost in great numbers (>50%) during and after spawning. Westslope cutthroat adults of that age do not respond well to stress. Skin deterioration with fungal infestation was very evident, although actual cause of death was not quantified. Many of these fish were also lost to bird depredation.

## **SPECIAL PROJECTS**

### **Fish Tagging Operations**

The hatchery crew took part in tagging two different groups of fish for regional monitoring programs. To better identify westslope cutthroat found in the sportsmens' creel from Lake Pend Oreille and Priest Lake, 165,000 one-year-old fish were adipose-clipped. A tagging crew was hired to clip 60,000 fish for the Lake Pend Oreille net pen project and 100,000 for Priest Lake. The net pens were loaded in the fall of 1990, but the Priest Lake fish will not be released until the spring of 1991.

Table 7. Fish health report for Clark Fork Hatchery, October 1, 1989 to December 31, 1990.

Date	Log No.	Species/lot	Diagnosis	Remarks
12/1/89	89-221	KL-CdA BdYr89	Negative for disease agents	Annual brood inspection for Coeur d'Alene lake fish.
3/19/90	90-72	C2 Brood year 1989	Positive for BKD	Fish not tested for other pathogens.
5/8/90	90-120	C2 Brood stock(all)	Positive for BKD & coldwater	BKD and coldwater disease in all brood ponds, negative for viral pathogens.
5/9/90	90-121	C2 Brood year 1989	Negative for virus	Not checked for BKD, negative for cold water disease.
5/9/90	90-122	C2 Brood year 1988	Positive for coldwater disease	Negative for viral pathogens and BKD.
7/19/90	90-178	C2 Brood year 1989	Positive for BKD	Negative for viral pathogens and cold water disease.
9/6/90	90-236	C2 Brood year 1990	Negative for virus	Not checked for BKD or coldwater disease.
5/9/90	90-123	BK naturalized Spring Cr population	Negative for virus and BKD	Fish captured from headrace above long raceways. Not checked for coldwater disease.
7/19/90	90-187	BK Spring Cr population	Positive for IPN virus	Fish captured from headrace above long raceway. Negative for BKD.
9/25/90	90-252	BK Spring Cr. population	Positive for IPN virus	Fish captured from beaver ponds in the water supply. Negative for BKD.

### Feed Experiments

A feed study was initiated in July 1989 to evaluate the claim that a particular feed reduced the occurrence of BKD. This was of interest because low-grade infections of BKD are ever-present at Clark Fork Hatchery. We compared Bio-moist, Bio-dry 4000, and Rangen soft-moist (top laced with Gallimycin) to Rangen soft-moist (control). Although no outbreak of BKD has occurred, the inability to get frozen Bio-moist, along with a poor conversion rate, caused us to abandon the Bio-moist part of the experiment in the spring of 1990. To date, all lots of test fish show signs of BKD. Final evaluation of this experiment will not take place until the fish are planted in 1991. Some sidelights of the experiment are already noteworthy. The average growth rates to date for these fish are as follows: Bio-dry 4000 is .0094 inches per day, Rangen soft-moist (top laced with Gallimycin) is .0083 inches per day, and Rangen soft-moist (control) is .0088 inches per day.

During the past few years, heavy losses in the cutthroat trout have been attributed to coldwater disease. In July 1990, a 21-day treatment of terramycin was given to all swim-up cutthroat fry to raise resistance to this disease. To date, some fish in all the units have had signs of coldwater disease. These fish will receive another treatment in the spring of 1990 before a final report is written.

### Net Pens

The Lake Pend Oreille net pen project, which began last summer, saw its first year class of westslope cutthroat reared very successfully this year. In addition to the two nets purchased and installed at Harbor Marina in Garfield Bay, two nets and frames were donated by local sportsmens' clubs and located in Scenic Bay. The sites chosen for these nets were at Scenic Bay Resort and The Bitter End Marina. In October 1989, the Garfield Bay nets were loaded with yearling cutthroats averaging 4.3 inches in length. The Scenic Bay Resort net was loaded in November with fish averaging 4.7 inches. The net at The Bitter End was loaded in early March 1990 with fish averaging 5.5 inches. Each net measured 20 ft x 20 ft x 20 ft and received 10,000 adipose-clipped fish. Initial stocking densities ranged from 0.035 to 0.072 lbs per cubic foot.

Employees from each of the marinas were responsible for feeding fish, picking mortalities, and periodic cleaning of nets. Mortalities remained low throughout the operation. Total mortalities varied between 30 and 180 fish per net for the entire period (0.04% to 0.22% per month). For comparison, mortality in the same group of fish at the hatchery varied between 0.03% and 0.39% per month during this period. Very little cleaning of the nets was necessary during the first five months of use. After five months, however, algal growth began to restrict water exchange within the nets, and dissolved oxygen levels dropped below saturation (10.5 ppm). Marina employees and hatchery personnel began brushing the top six feet of net once a week to remove excess algae and restore

good water circulation. This was successful until longer days and warmer water in April dramatically increased the rate of algal growth and net fouling.

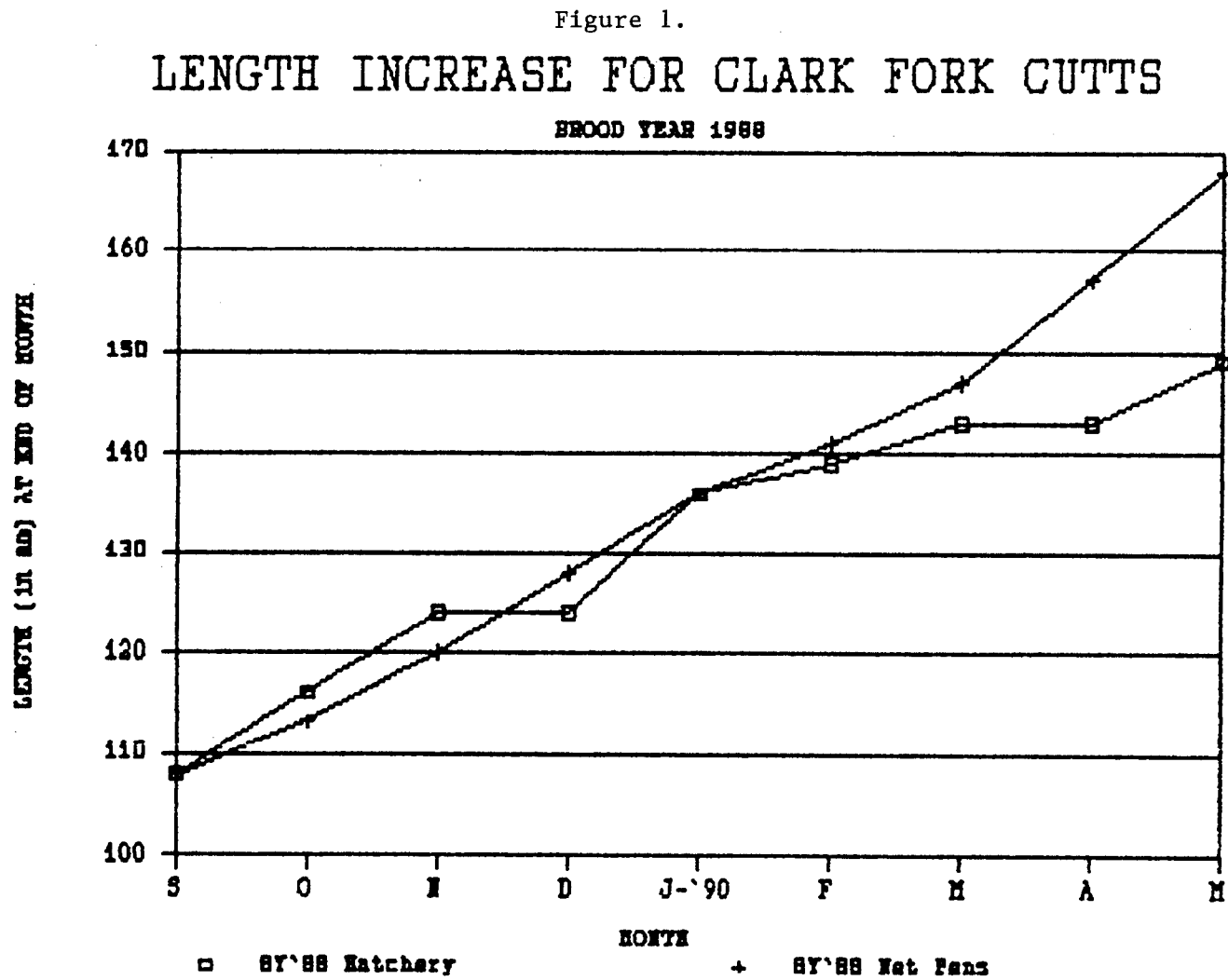
As expected, we saw a decrease in net fouling as mesh size increased. The 1/4-inch mesh net fouled most rapidly. Water exchange was practically nonexistent, and dissolved oxygen fell to 5.0 ppm, even with repeated cleaning. We do not advise using 1/4-inch nets for this program. Water flows were reduced by about 50% in the 1/2-inch nets, but dissolved oxygen was only reduced to 7.5 ppm, and brushing the net quickly restored the dissolved oxygen to saturation. Little fouling and no decrease in the dissolved oxygen was seen in the net with 3/4-inch mesh. We recommend using the largest mesh size possible to eliminate the need for cleaning and minimize the stress on fish from oxygen depletion. This will, of course, depend on the size of fish to be stocked into the nets in October. Cutthroats at 26 fish/lb were successfully retained in our 3/4-inch net. This minimum size may be found to be even smaller upon closer investigation.

Three of the nets were fed with Babington automatic feeders, while the fish at Scenic Bay Resort were fed by hand once per day. No differences in growth or conversion rates were seen, but hand-fed fish appeared to be more uniform in size. Fish were fed at 0.7% body weight per day, with a total of 2,900 lbs of feed used at all four sites combined. Upon release of the fish in May of 1990, we recorded a gain of 2,044 lbs over the period. This produced an average feed conversion of 1.42:1 for net pen-reared fish. Throughout the winter, growth rates remained very close to 0.26 inches/month. With warming water temperatures in April and May, however, growth increased to 0.31 inches/month. Pound counts and length measurements showed an average length at release of 6.3 inches. For comparison, growth at the hatchery averaged 0.21 inches/month through the winter and 0.27 inches/month during May. Hatchery feed conversions averaged 1.65:1 for cutthroats of the same year class. Figure 1 graphs the length increase for net pen-reared fish and hatchery-reared cohorts from net loading to release. The period of accelerated growth in net pen fish is quite evident.

Reducing the Department's cost to rear these fish to 6 inches at the hatchery was the primary objective of this program. In this first year of the program, it has been necessary for the hatchery to invest a certain amount of money to get the project started and to assure smooth operation from loading to release.

Clark Fork Hatchery purchased one net and floating frame and two coin-operated gum ball (fish feed) dispensers costing a total of \$1,393. This year, administration and maintenance time was only slightly less than time that would have been spent on these fish at the hatchery. Due to the fact that none of the marina employees have had any fish culture experience, hatchery personnel made regular trips to each pen site to monitor progress and train marina employees in proper care and maintenance of fish and nets. In future years, this time and expense should be greatly reduced, as sportsmens' groups provide the bulk of the funding and marina workers become familiar with net pen rearing and operation. Cost savings to IDFG have already been evident in fish feed purchases.

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Feed consumption was reduced by 473 pounds (14%) when compared to cutthroat reared at the hatchery. In addition, 61% of the feed used in the net pens was purchased by private sportsmens' groups. The feed cost to produce 2,044 lbs of gain at the hatchery over this period would have been \$2,327. That cost in the net pens was \$2,000, of which only \$780 was actually paid for by Clark Fork Hatchery. This resulted in a savings to the Department of \$1,547, which compensates for the one-time expense of purchasing the net and frame. If this project continues, the financial benefit could be noticeably greater if more fish are reared in pens and IDFG purchases none of the feed for them.

The greatest benefit to IDFG, however, was in public relations. Media coverage was excellent. Four newspapers and three television stations covered both loading and release of the pens. •In addition, releases were made to the Associated Press and were available nationwide. Public interest and support locally is high. Participation by sportsmens' groups has developed good working relationships between these groups and the hatchery.

Following this successful season, challenge grant money was secured to construct a floating cedar dock to support an additional net. This dock would be able to weather open water conditions and be portable enough to move to desired locations. The final cost for this dock was \$4,450. Washington Water Power purchased the net for this dock and also replaced the 1/4-inch net that was at Garfield Bay with a new 3/4-inch net.

In September 1990, the net pen program was turned over to Sandpoint Hatchery and all nets and materials were transferred. Clark Fork Hatchery provided manpower to assist with net installations and delivered 60,000 adipose-clipped cutthroat to those pens in October of 1990. We have occasionally assisted with repairs to frames, docks, and moorage associated with these net pens, but Sandpoint Hatchery has been responsible for most of the labor since September 1990.

